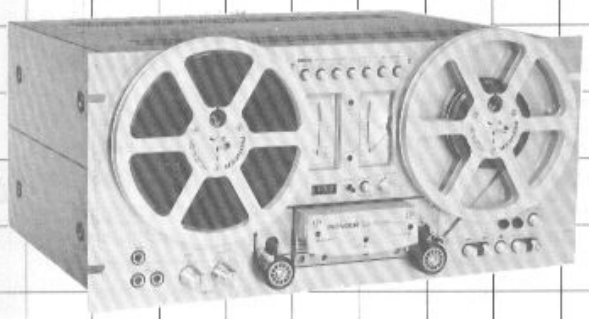
3-MOTOR 4-HEAD
TAPE DECK

RT-707

OPERATING INSTRUCTIONS

KCU



IMPORTANT NOTICE

The serial number for this equipment is located on the rear panel. Please write this serial number on your enclosed warranty card and keep in a secure area. This is for your security.

PIONEER

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

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POINTS TO BEAR IN MIND

KEEP THE TAPE HEAD SECTION CLEAN

The sound quality will deteriorate and other unforeseen difficulties may arise if you allow the areas of the heads, capstan, pinch roller, etc., which come into direct contact with the tape, to become dusty or dirty. Before actually using the tape deck, be sure to clean the surfaces of the heads with the cleaning swabs supplied with the deck. For further details, refer to page 21, "Care and Maintenance".

TAPE REELS

- Use 7-inch or 5-inch reels. Both reels should be of the same size. If they are not, they will slow down at different rates which leads to unstable tape run.
- Do not use reels which have been deformed or warped in any way, or reels with a broad tape width. If the tape comes in contact with the side of the reel, it will be damaged.

BE SURE TO CLAMP THE REELS

After you mount the reels, make absolutely sure that you clamp both reels so that they will not separate themselves from the bases during tape play (Refer to Fig. 2).
For further details, refer to the section on "Mounting the Reels" on page 7.

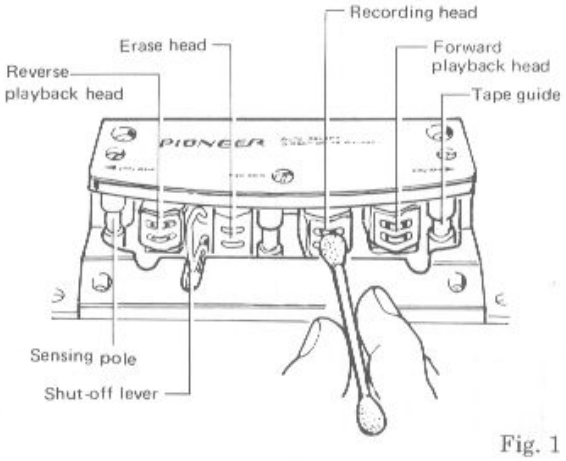


Fig. 1

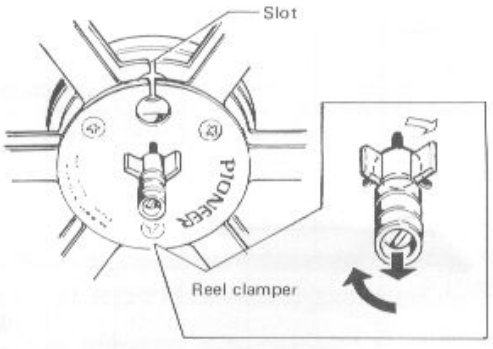


Fig. 2

FEATURES

Tough and Reliable Construction

The tape deck's construction combines a 5mm-thick front panel and a diecast frame for the outer casing to protect the heavy inside parts. The construction is designed to display the maximum precision and durability, and the front panel can be mounted in a rack conforming to EIA standards.

Tape Transport has D.D. Motor to Drive Capstan

The tape deck's AC servomotor with frequency generator features direct capstan drive. Even the slightest fluctuations in the speed caused by external factors are controlled by the servoamplifier and so the motor displays excellent load bearing characteristics, and it can also withstand fluctuations in voltage. Finally, the D.D. system reduces wow/flutter and yields a speed which is subject to minimal ageing.

For the reel drive, the tape deck uses a pair of 6-pole inner rotor induction motors with optimum torque characteristics. Their low moment of inertia and the use of solenoidacti - vated differential band brakes prevent undue tape strain and protect the tape.

Auto Reverse, Auto Repeat Mechanisms

The RT-707 with its four heads has a sensing tape auto reverse mechanism for return playback (material is recorded in one direction only). This allows recorded programs to be played back automatically over long periods of time without the tape being changed over or rewound manually. Also, there is an auto repeat mechanism (repeat button) which employs the tape deck's tape counter. The sensing tape and the repeat button are used together for repeated automatic playback. Finally, the added attraction of a tape direction selector button allows you to reverse the direction of tape play at the desired position.

Independent Recording Amplifier Circuit for LINE and MIC Inputs

The recording amplifier features a high S/N, and the microphone amplifier displays an input sensitivity high enough for use with 600-ohm professional microphones. The dynamic range is an amazing 58dB. Powered by a regulated power supply and unaffected by fluctuations in the voltage or by changes in the temperature, this circuit ensures stable recordings at all times. In addition, there are independent LINE and MIC recording level controls to enable you to have fun with mixing recording.

Convenient Accessory Function

PITCH CONTROL knob: This control is used to change the rated tape speed during playback (19cm/s, 9.5cm/s) across a ±6% range – in other words, the tape can be made to go 6% faster or slower.

Musical steps can be raised or lowered as far as the semitones. This means that you can bring the steps of the recorded music into line with the steps of the instrument which you are playing. This control is therefore useful when you are using a tape for song accompaniments.

REC MODE button: Program sources can be recorded not only in stereo, but also in mono using the left or right channel only. This button allows you to use your recording talents and techniques to the full whether you want to record mono signals over a prolonged period of time, dabble with mixing recording or try out sound-on-sound recording. It gives you a range of possibilities that you would expect from the tip-top RT-707.

CHOOSING A LOCATION

To ensure the best sound quality and trouble-free operation, avoid setting up the tape deck in any of the locations described below.

Locations liable to downgrade performance and result in breakdowns	Resulting trouble
1. Locations exposed to direct sunlight, or near heaters or other heat sources.	1. External heat causes the performance of circuit parts to deteriorate, and operation becomes unstable.
2. Locations with poor ventilation, or with high humidity or moisture contents. Dusty locations.	2. Cause of faulty contact in input/output terminals, and of rust. High humidity and a high moisture content cause deterioration in insulation. There is also the danger of current leakage and heat generation in circuit parts. Dust or grease in the rotating parts causes the parts to deteriorate.
3. Locations susceptible to vibration.	3. These locations affect the precision parts adversely.
4. Locations where there are thinners, benzine and other types of volatile liquids; insect sprays or any kind of inflammable objects at hand.	4. These help corrode the front panel. In particular, the heads are precision-finished to micron dimensions. Chemicals may reduce their performance, so exercise all due care.

FRONT PANEL FACILITIES

POWER SWITCH

Push this switch and power is supplied to the tape deck. Push for a second time to turn the power off.

SPEED SWITCH

This switch selects the tape speed. Push for a 9.5cm/s speed; push again for a 19cm/s speed (released position).

19cm/s: Used for recording music programs, etc.

9.5cm/s: Used for recording lengthy conversations, etc.

PAUSE LAMP

This green lamp lights up when the PAUSE button is pressed to indicate the tape has stopped temporarily.

PHONES JACK

This is the output jack for stereo headphones. Signals selected by the MONITOR switch are available here. Use it when you want to monitor the recording or listen to a performance directly taped from the RT-707. The output level is not variable.

NOTES:

- *Please use low impedance-type headphones. If you use high impedance-type headphones, you may not obtain sufficient volume.*
- *Do not connect a microphone to this jack, as the microphone may be damaged.*

MIC JACKS

These are the input jacks for microphone recording. The L (left) and R (right) channels can be used independently. Only the microphones' input signals are recorded if the REC/PLAY connector (DIN specifications) on the rear panel and the MIC jacks are connected at the same time. As long as the microphones have a standard 6mm diameter plug, you can use either a low impedance (600-ohms) or high impedance (10 – 50kohms) type.

MIC RECORDING LEVEL CONTROLS

Use these controls to adjust the recording level when you are recording with a microphone (or microphones) or when you are using the rear panel REC/PLAY connector (DIN standard). Use the outer control for the right and the inner control for the left channel. Input signals from both the MIC jacks and the REC/PLAY connector cannot be recorded simultaneously.

LINE RECORDING LEVEL CONTROLS

Adjust the recording input level from the LINE INPUT terminals on the rear panel. The level increases as the controls are turned to the right. The outer control is for the right channel and the inner, for the left.

RECORDING LAMP (REC)

This red lamp lights up during recording. Check that it has lit up before recording.

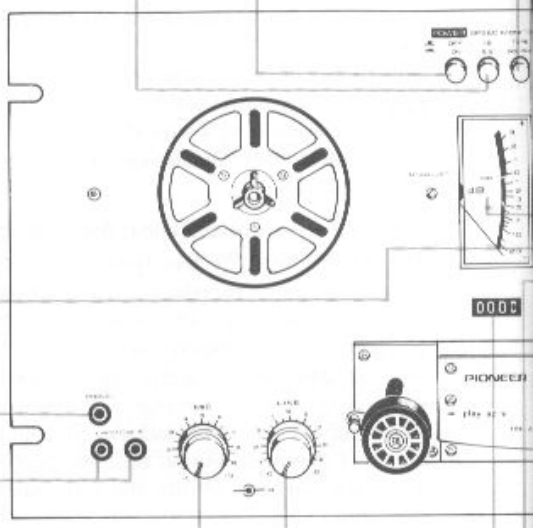
MONITOR SWITCH

Use this switch to monitor your recording.

TAPE: Allows you to listen to the recorded signals.

SOURCE: You can listen to the signals before recording if this position is selected (press switch once).

If this switch is switched alternately to SOURCE and TAPE during recording, you can compare the sound signals before and after recording.



TAPE COUNTER

This indicates how much tape has been recorded or played back and how much there is left over.

REPEAT BUTTON

This button allows you to reverse the tape forward for reverse playback automatically. If you remember to work the tape counter and REPEAT button, then the tape will automatically be reversed and the tape deck will be set to forward playback when the "0000" display on the tape counter gives way to "9999" during reverse playback. For details, refer to the section "Auto Repeat " on page 12. Be sure to release this button when you do not require repeated playback.

COUNTER RESET BUTTON

Push this button to reset the tape counter to "0000"

BIAS SWITCH

This selects the recording bias current according to the type of tape used for recording. Push for LH tapes; push again for STD tapes (released position).

STD: For standard tapes.

LH: For low noise and high output tapes.

EQ SWITCH

This selects the recording equalization characteristics according to the type of tape used.

Push for LH; push again for STD (released).

STD: For standard tapes.

LH: For low noise and high output tapes.

(For further details on how to use the BIAS and EQ switches, refer to the "BIAS and EQ Switches" on page 15).

REC MODE SWITCHES (L. R)

Depress these switches when recording.

L: Use this switch for L (left) channel recording.

R: Use this switch for R (right) channel recording.

For stereo recording, make sure that you depress both switches.

TAPE DIRECTION SELECTOR BUTTONS

These buttons allow you to select the direction of tape play during playback. When depressed, the button's lamp will light up to indicate the direction of tape play.

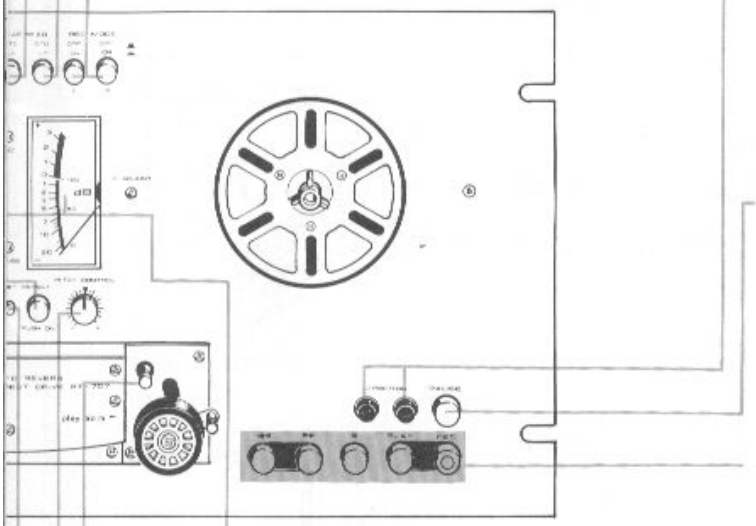
Forward playback: The tape runs from left to right.

Reverse playback: The tape runs from right to left.

When you are recording, you cannot change the direction of tape play even by depressing this button. The tape will always run in a forward direction.

PAUSE BUTTON

This temporarily stops the tape during tape play. When pressed during recording or playback, the tape merely stops. When pressed again, the tape starts to run. This button does not work during fast forward or rewind.



FUNCTION BUTTONS

◀◀ REWIND: This causes the tape to be wound at a high speed from the right to the left reel.

▶▶ FAST FORWARD: This causes the tape to be wound at a high speed from the left to the right reel.

PLAY: For tape playback, or recording, push this button.

REC: To record, press this button together with the PLAY button.

■ STOP: This stops the tape and releases the other function buttons.

NOTE:

- *The function buttons will not return to their preset positions if the power is turned off.*
- *The tape will always run in a forward direction when the POWER switch is depressed to the ON position.*
- *If you depress both the PLAY and REC buttons with the tape set to the reverse playback direction, then the tape will sometimes move slightly backwards and then start to run forwards. Therefore, when recording, make sure that you set the DIRECTION button to the forward playback position.*
- *There is no need to press the (■) stop button if you want to change over from one function to another.*

LEVEL METERS

These allow you to read out the levels during recording and playback. When the MONITOR switch is set to SOURCE, they indicate the input signal level, and when set to TAPE, they indicate the playback output level.

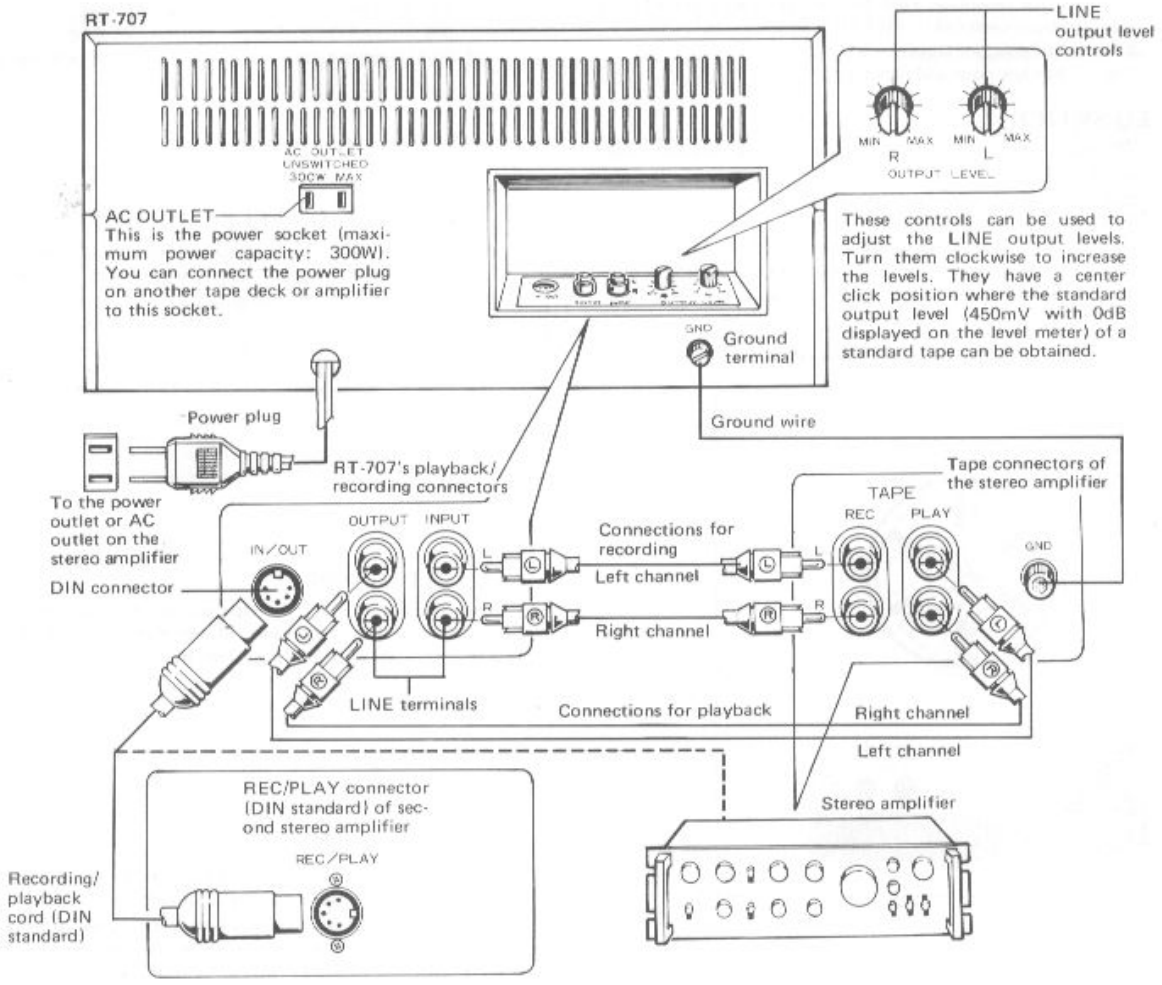
CAPSTAN

This rotates when the power is switched on. Together with the pinch roller, it keeps the tape at its rated speed.

PITCH CONTROL KNOB

You can use this to make the tape travel 6% faster or slower than the normal tape speed during playback. When set to the central position, the tape speed is 19cm/s or 9.5cm/s (standard values). Turn the control to the left and the speed drops and the musical steps are lowered; conversely, turn it to the right, and the speed rises and the musical steps are raised. This control cannot be used during recording.

CONNECTION DIAGRAM


RT-707
LINE
output level
controls
MIN MAX MIN MAX
R L
OUTPUT LEVEL
AC OUTLET
This is the power socket (maximum power capacity: 300W). You can connect the power plug on another tape deck or amplifier to this socket.
These controls can be used to adjust the LINE output levels. Turn them clockwise to increase the levels. They have a center click position where the standard output level (450mV with 0dB displayed on the level meter) of a standard tape can be obtained.
GND
Ground terminal
Ground wire
Power plug
To the power outlet or AC outlet on the stereo amplifier
RT-707's playback/recording connectors
Tape connectors of the stereo amplifier
TAPE
REC
PLAY
OUTPUT
INPUT
IN/OUT
DIN connector
Connections for recording
Left channel
Right channel
LINE terminals
Connections for playback
Right channel
Left channel
REC/PLAY connector (DIN standard) of second stereo amplifier
REC/PLAY
Recording/playback cord (DIN standard)
Stereo amplifier

CONNECTIONS

Use the accessory connecting cords to connect the RT-707's LINE terminals with the tape terminals on the stereo amplifier or receiver. The terminals in front are for the right channel and those behind are for the left channel.

If you do not connect the tape deck with the other audio equipment properly, you will hear a monotonous single-pitched hum and this will impair your recording. Take care, therefore, to connect properly.

Connections for playback: Connect the TAPE PLAY input terminals on the stereo amplifier with the LINE OUTPUT terminals on the RT-707.

Connections for recording: Connect the TAPE REC output terminals on the stereo amplifier with the LINE INPUT terminals on the RT-707.

Using the REC/PLAY connectors: If the stereo amplifier is equipped with DIN recording/playback connectors, use DIN recording/playback cords, which are sold separately, to connect the REC/PLAY connectors on the RT-707 and the stereo amplifier. There is no need for the accessory connecting cords since the same connections serve for both recording and playback. Adjust the recording level with the MIC recording level controls. Refer to the section "Mixing Recording" on page 16 when you want to record signals mixed with those from a second stereo amplifier.

THREADING THE TAPE

Use either two 7-inch or two 5-inch reels with this tape deck. Use reels of the same size and of the same material (use metal with metal, or plastic with plastic, for example). You may damage the tape if you use reels with different sizes and materials.

MOUNTING THE REELS

Mount the reel with the tape on the left-hand reel base, and the take-up reel on the right. Make sure that the reel bases are stationary when you mount the reels. As shown in Fig. 3, pull the reel clamps toward you, align the top and bottom pawls and insert the reels. Next, pull the reel clamps toward you, turn to the right or left, and they will clamp the reel into place.

Threading the tape

Unwind two turns of tape from the left-hand reel and thread the tape as shown in Fig. 4, inserting the end of the tape into the winding slot in the take-up reel. To facilitate tape threading, lock the left and right tape guides as shown in Fig. 5. Pressing the PLAY button automatically releases this lock, but return the lock manually for fast forward and rewind.

Winding the tape

Wind 5—6 turns of tape onto the right-hand reel to take up the slack so that the tape does not slip loose when tape transport begins.

NOTE:
Turn the reels and check that the tape is not touching the edges of the reels and that the reels do not move while the tape is running.

SHUT-OFF MECHANISM

If the tape runs out from either reel, or if it becomes slack, this mechanism automatically stops the tape and the function buttons are released. As shown in Fig. 6, the shut-off lever causes the shut-off switch to go to OFF since the reel drive motor stops.

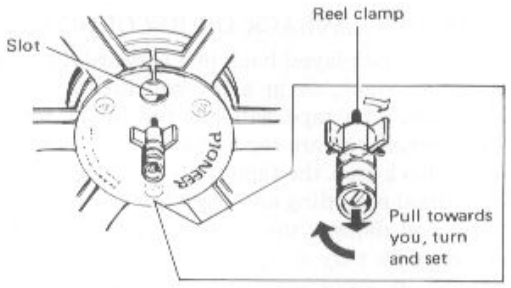


Fig. 3

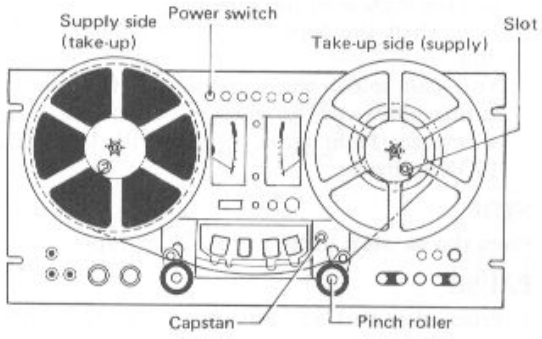


Fig. 4

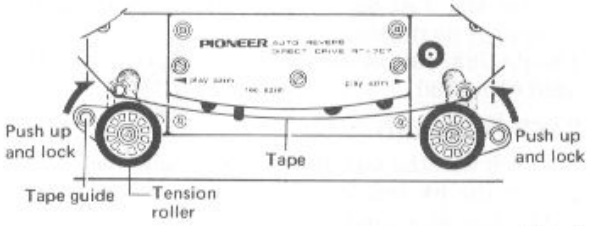


Fig. 5

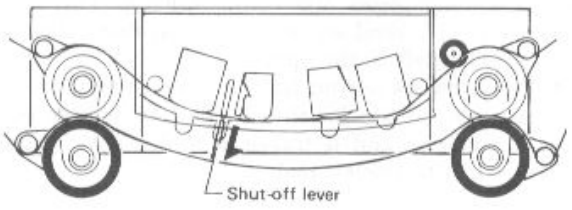


Fig. 6

BASIC OPERATIONS

TAPE PLAY (PLAYBACK OR RECORDING)

The tape can be played back in a forward direction from left to right, or in a reverse direction from right to left. The tape will not run in the reverse direction when you are recording.

1. First, check that the tape is on the left-hand reel for normal recording and playback.
2. When you depress the tape PLAY button when you want to play a tape back, the tape will run forward in accordance with the tape direction selector button. If you depress both the PLAY and the REC buttons when you want to record a tape, then the tape will run in a forward direction.
3. You can select the direction of the tape play during playback (forward ▶ : from left to right; ◀ reverse: from right to left) with the DIRECTION buttons.

STOP

Press the ■ stop button to stop the tape.

PAUSE

1. Press the PAUSE button while the tape is playing (during playback or recording).
2. The tape stops. The play function button remains in the "on" state.
3. Press the PAUSE button again and the tape resumes its running.

The PAUSE button does not work during fast forward or rewind.

FAST FORWARD

1. Check that the tape is on the left-hand reel.
2. Press the ▶▶ fast forward button.
3. The tape is wound at a high speed from the left to the right reel.
4. Press the ■ stop button to stop the tape.

- To return the tape deck from fast forward to tape play, press the PLAY button. The tape stops for several seconds and then starts playing from the left to the right reel.
- Press the ◀◀ rewind button if you have wound the tape on too far ahead. The tape is then put into reverse and it travels at a high speed from the right to the left reel.

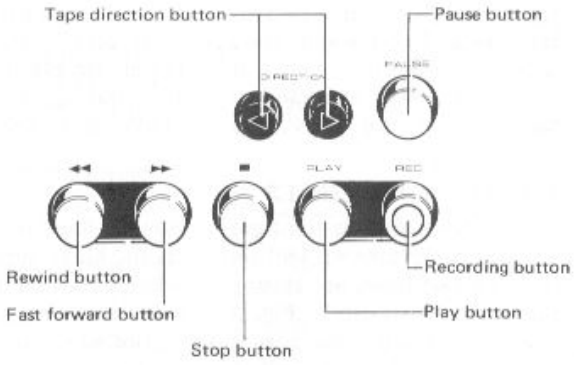


Fig. 7

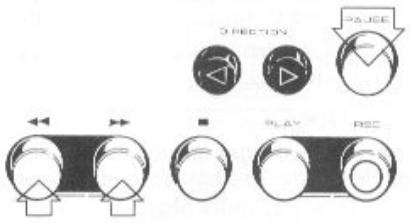


Fig. 8

NOTE:

1. *There is no need to press the ■ stop button when changing over from one function (fast forward, for example) to another (like tape play). Just press the appropriate function button.*
2. *With long-playing tapes, and especially with thin tapes, press the ▶▶ fast forward and then the ◀◀ rewind buttons, or the rewind and then the fast forward buttons, when you want to change over from fast forward or rewind to stop or tape play. Then press the ■ stop button or the PLAY button when the rotating reels slow down. This helps prevent tape elongation and distortion.*
3. *The auto reverse mechanism and the DIRECTION buttons will not work during fast forward or rewind.*

REWIND

1. Check that the tape is on the right-hand reel.
2. Press the ◀◀ rewind button.
3. The tape is rewound at a high speed from the right to the left reels.
4. Press the ■ stop button to stop the tape.

- To return the tape deck from rewind to tape play, press the PLAY button. The tape stops for several seconds and then starts playing from the left to the right reel.
- Press the ▶▶ fast forward button if you have rewound too much tape. The tape is then put into reverse and it travels at a high speed from the left to the right reel.

SETTING THE TAPE SPEED (Fig. 9)

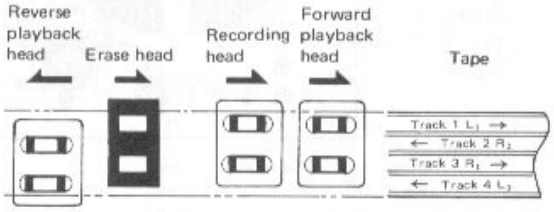
1. Set the recording tape speed or check the playback tape speed (19cm/s, or 9.5cm/s).
2. Turn the SPEED switch to the appropriate position.
   19cm/s: Press switch twice (released position ■)
   9.5cm/s: Press switch once (depressed position ▬)

Setting the tape speed to 9.5cm/s enables you to double the recording time, compared with a 19cm/s tape speed.

TAPE TRACKS

The RT-707 is a 4-track, 2-channel tape deck. A track is that strip of the tape which is recorded (magnetized). Channel refers to the recording/playback system. First, L channel signals are recorded on track 1 and R channel signals are recorded on track 3. When the tape has been taken up and the reels changed over, the L channel and R channel signals are recorded on tracks 4 and 2, respectively. With playback, the track 1 (L channel) and track 3 (R channel) are played back in the forward direction, and the track 4 (L channel) and track 2 (R channel) are played back when the tape is reversed automatically with the auto reverse mechanism, or manually.

Fig. 9



Signal vs. Track

L_1 channel signal	Track 1
R_1 channel signal	Track 3
R_2 channel signal	Track 2
L_2 channel signal	Track 4

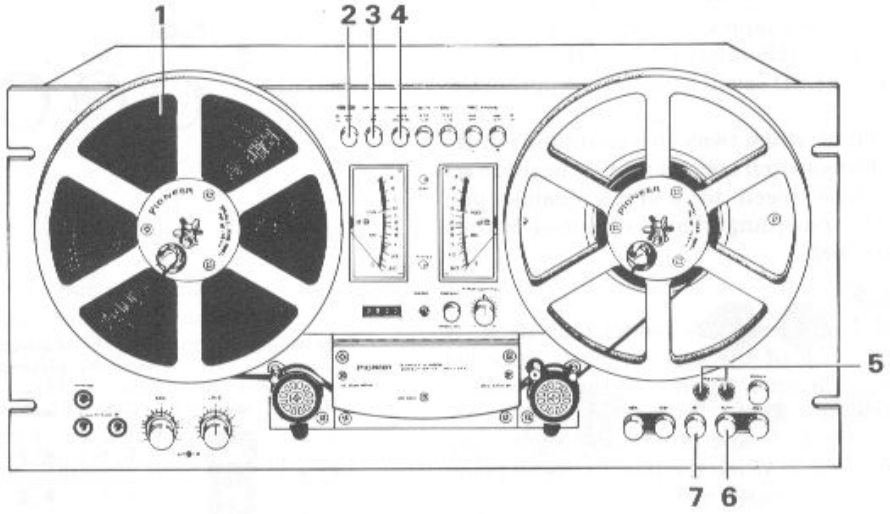
Fig. 10

PLAYBACK

Before turning the POWER switch on, set the controls as follows:

1. PAUSE switch is set to OFF (released position).
2. Press counter reset button and set counter to "0000".
3. REPEAT button is set to OFF.
4. Set MONITOR switch to TAPE.
5. Turn LINE and MIC recording level controls fully to left.
6. Set PITCH CONTROL knob to central position.
7. Check connections between RT-707 and stereo amplifier or receiver.
8. Check whether head is dirty. Clean if necessary.

The numbers in the illustration correspond to the steps involved in the playback procedure.



1. Attach the tapes.

Attach the tape you want to play back (pre-recorded tape) to the left-hand reel base.

2. Push POWER switch and turn power on.

The level meters light up and the capstan starts rotating as soon as the power is switched on.

3. Check the tape speed.

Decide whether the tape to be played was recorded at 19cm/s or 9.5cm/s, and set SPEED switch accordingly.

4. Set MONITOR switch to TAPE.

Set the tape monitor switch on the stereo amplifier which is connected to the RT-707 to ON (playback mode).

5. Check the tape direction selector buttons (DIRECTION).

When the POWER switch is depressed and power is supplied to the tape deck, the forward lamp lights up to indicate that the tape will play in the ▶ forward direction. If the tape is set on the right-hand reel, depress the ◀ reverse DIRECTION button.

6. Depress the PLAY button.

The tape runs in accordance with the DIRECTION button setting in the playback mode. The tape can be reversed manually anywhere you like in the playback mode if you depress the DIRECTION button.

The shut-off switch goes off and the tape stops if there is any slack in the tape. Be sure to keep the tape taut. If you want to stop the tape temporarily during playback, press the PAUSE button.

- You can adjust the tape speed within ±6% of its rating with the pitch control.

7. When playback has finished.

When playback has finished, press the ■ stop button. If the tape has run out during playback, the shut-off switch goes off and the tape deck is automatically set to the stop mode.

- To adjust the sound quality and volume, operate the controls on the stereo amplifier.

AUTO REVERSE

You can automatically reverse the tape from a forward to a reverse direction during playback if you stick the accessory sensing tape onto the magnetic surface of the playback tape. Moreover, you can also reverse the direction of the playback tape from reverse to forward by using the auto repeat mechanism. Finally, you can change over the direction of the tape manually to forward or reverse even during auto reverse by depressing the appropriate tape direction selector button (DIRECTION).

- The tape always goes from forward to reverse with automatic reverse which makes use of the sensing tape. It will never go from reverse to forward.
- On the other hand, the tape always goes from reverse to forward with automatic reverse which makes use of the auto repeat mechanism. It will never go from forward to reverse.

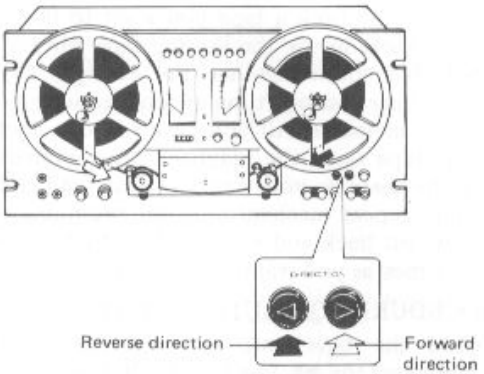


Fig. 11

STICKING THE SENSING TAPE (Fig. 12)

1. Use the accessory sensing tape (7 — 10mm).
2. Stick the sensing tape onto the magnetic surface of the playback tape exactly where you want it to be automatically reversed. Make sure that the sensing tape does not protrude over the edges of the playback tape.
   It does not matter if that part of the tape earmarked for the sensing tape is the leader section.
3. Smooth the sensing tape to remove any air bubbles.

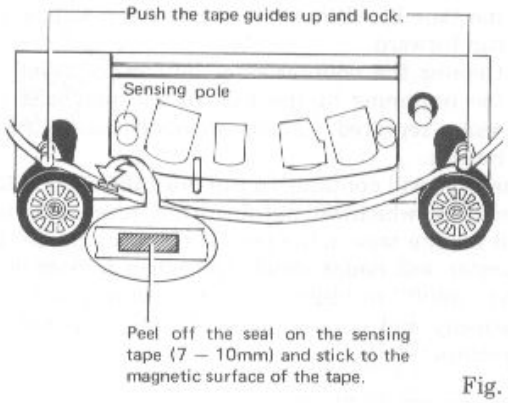

Push the tape guides up and lock.
Sensing pole
Peel off the seal on the sensing tape (7 — 10mm) and stick to the magnetic surface of the tape.

Fig. 12

ADJUSTING THE PLAYBACK SPEED

Using the PITCH CONTROL knob, you can change the tape speed to within ±6% of that speed which has been selected by the SPEED switch (19cm/s, 9.5cm/s). Turning this control to the left from the central position slows down the tape speed and lowers the musical steps. Turning it right round to the left lowers the musical steps by a semitone. Conversely, turning the control to the right, increases the tape speed and raises the musical steps. Turning it fully to the right raises the musical steps by a semitone.

If you listen to the playback sound and adjust this control, you can easily harmonize the musical steps of the music you want to perform.

Normally, this control is kept to the central position during playback.

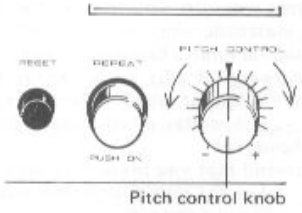


Fig. 13

AUTO REPEAT

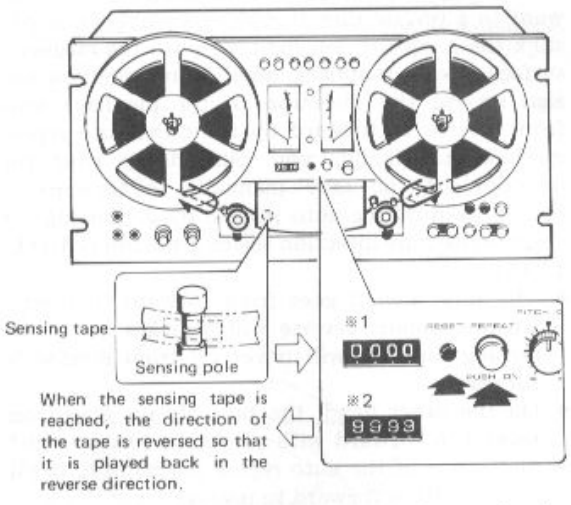
You can play back a tape you want to hear again and again if you use the sensing tape and the auto repeat mechanism together. For example, say you want to hear just one tune or song from a group of recorded melodies. All you have to do is stick the sensing tape onto the playback tape immediately after the melody you want to hear, and then set the auto repeat mechanism at the beginning of the melody. Sit back and you will hear that melody as many times as you want to without lifting a finger.

PROCEDURE FOR AUTO REPEAT

1. Wind the tape onto the right-hand reel by depressing the ▶▶ fast forward button.
2. Stick the sensing tape onto the end of the tape on the right-hand reel.
3. Wind the tape onto the left-hand reel by depressing the ◀◀ rewind button.
4. Depress the ⏩ forward DIRECTION button and the tape PLAY button, and the tape will start to run forward.
5. Depress the counter reset button to "0000" at the beginning of the part of the playback you want repeated. Then, depress the REPEAT button.

The tape will continue to run until the sensing tape is reached which will automatically reverse the tape and set the tape in the reverse playback mode. The counter will count down and when it goes down past "0000" to "9999", the tape is reversed automatically and is now played back in the forward direction.

NOTE:
If you continue the auto-repeat play for a long period of time, the position at which the returned tape begins to play again may slip. This trouble might be caused by the tape materials, the winding conditions or other unfavorable factors. Therefore, when you intend to perform auto-repeat play for a long time, you should set the "0000" point which detects the starting point for the forward re-play when some tape remaining on the right-hand reel.
We recommend that you press the counter reset button to "0000" when the tape counter has advanced over 15 counts after loading the tape.


Sensing tape
Sensing pole
When the sensing tape is reached, the direction of the tape is reversed so that it is played back in the reverse direction.
※1
0000
※2
9999

※1 Push this button at the desired position on the tape when the tape is running in the forward direction.
※2 The direction of the tape is automatically reversed when the counter reaches "9999" when the tape is running in the reverse direction.

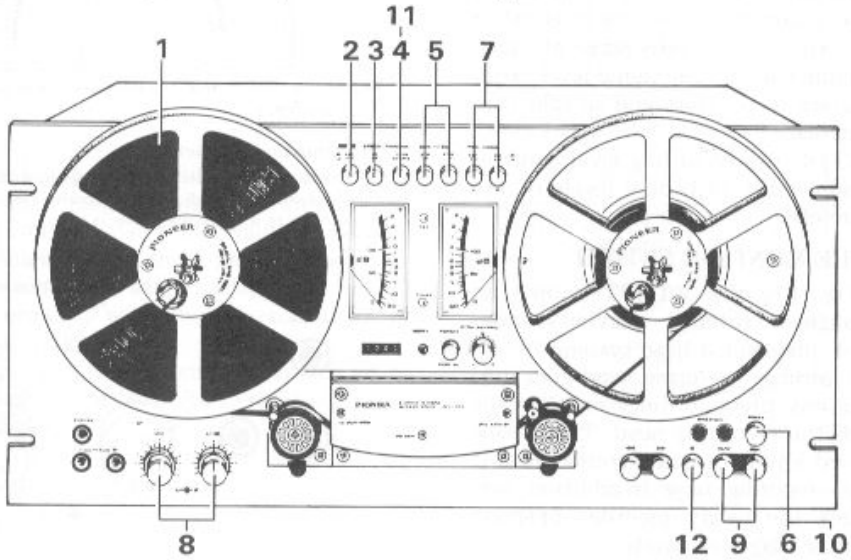
Fig. 14

RECORDING

Before turning the POWER switch on, set the controls as follows:

1. PAUSE switch is set to OFF (released position).
2. Press counter reset button and set counter to "0000".
3. REPEAT button is set to OFF.
4. Set MONITOR switch to TAPE.
5. Turn LINE and MIC recording level controls fully to left.
6. Set PITCH CONTROL knob to central position.
7. Check connections between RT-707 and stereo amplifier or receiver.
8. Check whether head is dirty. Clean if necessary.

The numbers in the illustration correspond to the steps involved in the recording procedure.



1. Attach the tapes.
Attach the tape you want to record to the left-hand reel base.

2. Push POWER switch to turn power on.
The level meters light up and the capstan starts rotating as soon as the power is switched on.

3. Setting the tape speed.
Set the SPEED switch to 19cm/s or 9.5cm/s in accordance with the program source you intend to record.

4. Set the MONITOR switch to SOURCE.

5. Setting the BIAS and EQ switches.
Refer to the section on "Bias and EQ Switches" on page 15 and set the switches in accordance with the type of tape you intend to record on.

6. Press the PAUSE button.

7. Selecting the REC MODE switches (L, R)
Normally, both switches are depressed. However, depress only the L or R switch for mono recordings.

8. Setting the recording level.
The level meter pointers will deflect in accordance with the strength of the input signal. Adjust the LINE or MIC recording level controls so that the pointers do not deflect into the red areas. The recording level control (LINE or MIC) of the terminal to which no signal is applied should be set to its lowest position. For further details, refer to the section on "Recording Level Adjustments" on page 14.

9. Press PLAY and REC buttons together.
The REC lamp will light up.

10. Start recording.
Release the PAUSE button. The tape travels from left to right and the deck is set to the recording mode. If there is any slack in the tape, the shut-off switch goes off and the tape stops. Be sure to keep the tape taut.

11. Monitoring the recording.
Set the MONITOR switch to TAPE and compare the sound quality with that when the same switch was set to SOURCE. If there is anything unusual about the sound quality when the MONITOR switch is set to TAPE, this may indicate a deformed tape, a dirty head section or an irregularity in the recording level or BIAS and EQ switches. Track down the cause of the problem and start recording again.

12. When recording is completed.
When the recording is over, press the ■ stop button. If the tape runs out during recording, the shut-off lever causes the shut-off switch to go off and the tape deck is automatically set to the stop mode.

NOTE:
Press the PAUSE button if you want to stop the tape temporarily during recording.
If you depress the ■ stop button during recording and stop the tape, the REC button will be released and the tape deck will be set to the stop mode. To restart recording, depress both the REC and PLAY buttons again.

RECORDING LEVEL ADJUSTMENTS

Setting the recording level has a great effect on the playback sound.

The playback sound will be distorted if the level meter pointers deflect to the upper end of the scale during recording. Conversely, if the angle of deflection is too low, the S/N will deteriorate and there will be a high level of audible noise during playback. The best recording is assured if you adjust the recording level controls so that the level meter pointers deflect across a −3 — 0dB range at signal peaks in the program source. The signal level varies greatly from program to program and so take care in setting the controls.

As shown in Fig. 16, the recording level controls can be used to adjust the recording levels of the left and right channels.

HOW TO USE THE MONITOR SWITCH

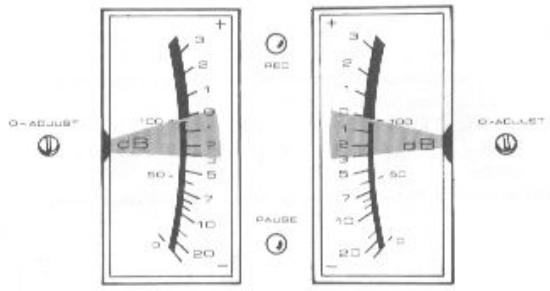
As shown in Fig. 17, the RT-707 adopts an independently aligned reverse playback/erase/recording/forward playback 4-head system.

While you are recording, the erase head goes into action and erases any pre-recordings on the tape before they reach the recording head. This means that you can record a new program source even if you are using a pre-recorded tape. In addition, you can also play back the newly recorded program immediately with the playback heads.

If you set the MONITOR switch to TAPE during recording, you can listen in to the program which has just been recorded. Setting the same switch to SOURCE allows you to listen in to the program which you are about to record and to check whether you want to go ahead and record it or not. Be sure to set the stereo amplifier's TAPE MONITOR switch to ON when monitoring the recording from the stereo amplifier.

ERASING RECORDED SOUND

- Turn the recording level controls (LINE, MIC) to the left as far as they will go and depress both the REC and PLAY buttons together if you want to erase completely a previously recorded program source.
- If you want to record a new program source on a tape which has previously been used for recording, the recording is automatically erased and the new program source is recorded instead.

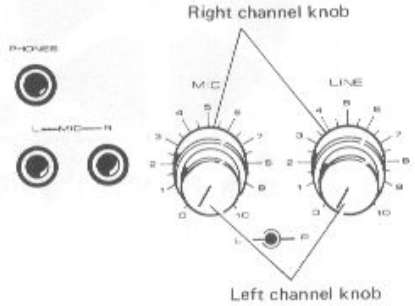


Adjust the level so that the pointers' deflection does not exceed 0 at signal peaks.

Zero-adjusting the meters

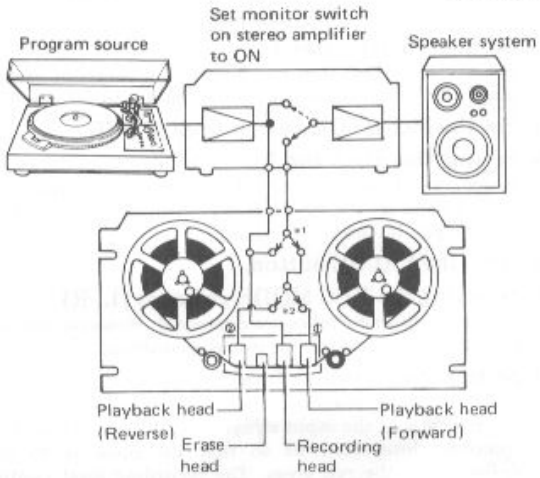
Both meters are provided with special screws for zero adjust. Use a small screwdriver to adjust these screws finely if the pointers do not point to zero when the power is off.

Fig. 15



Turning the controls adjusts both L and R channels at the same time. To adjust independently, hold the control you do not want to adjust and turn the control of that channel you wish to adjust.

Fig. 16



※1 Alternately set the MONITOR switch to the SOURCE and TAPE positions.

※2 The heads change along with the change in the direction of the tape.

Fig. 17

BIAS AND EQ SWITCHES

BIAS switch

In order for the tapes to give full rein to their characteristics and for you to keep distortion to the minimum, you must select a bias value in keeping with the characteristics of the tape you are using.

- If you record an LH tape with the BIAS switch set to STD, the bias becomes shallow, distortion increases and the high range level rises resulting in an unnatural sound.
- If a standard tape is used with the switch set to LH, the bias deepens and so the high range level drops.

EQ switch

Standard and LH tapes have different equalization values in the high range during recording and so you must not only choose a bias value in keeping with the characteristics of the tape, but also make allowances for high range equalization. Set the EQ switch in accordance with the characteristics of the tape you are using.

- If you record an LH tape with the switch set to STD, the high range level rises, resulting in an unnatural sound.
- If you record on a standard tape with the EQ switch set to LH, the high range level drops.

BIAS and EQ switch combinations with different makes of tape

Table 1 lists the standard combinations of the switches and tapes although the two switches allow a total of four combinations.
The table does not aim to give you absolute values. Feel free to press and release the MONITOR switch and compare the sound at TAPE with that at SOURCE. Set the switches so that the sound is to your liking.
(Before choosing the LH and STD positions, read the tape's 'instructions for use').

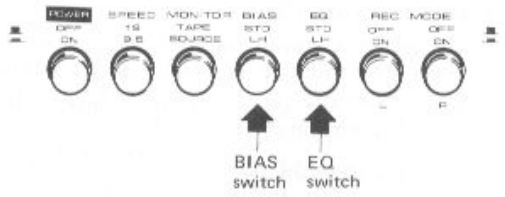


Fig. 18

Major Tape Brands & BIAS, EQ Switch Settings — Table. 1

Make of tape		BIAS switch		EQ switch	
		STD	LH	STD	LH
SCOTCH	177, 218, 229, CLASSIC		○		○
	203,206,211,212,213,228	○			○
FUJI	FB-151		○		○
	FM-150, FG-150	○			○
SONY	SUPER	○		○	
	SLH, DUAD		○		○
TDK	SD-150, AUDUA		○		○
	T-555	○		○	
MAXELL	LN-50		○	○	
	UD50, UD35, LNE-50		○		○
AGFA	PER-525		○	○	
	PE-36, PE-46	○			○
BASF	LH PROFESSIONAL LP35LH-HIFI, LP35LH LH SUPER		○		○
AMPEX	434, 444, 456	○			○
HITACHI	UDO		○		○

- This table is based on values displayed by the RT-707.
- The tapes' absolute values are not shown.
- If the sound is not to your liking with the EQ and BIAS positions listed in the table, try a different position.

MICROPHONE RECORDING

STEREO RECORDING

Connect either a stereo microphone or two identical models to the MIC jacks (L and R), as shown in Fig. 19. For the recording procedure, refer to section on "Recording" on page 13.

Points to bear in mind

- You can use either low impedance (600-ohms) or high impedance (10 — 50-kohms) microphones.
- If you are using a high impedance microphone, make sure that its cable is not more than 5 meters long.
- When not recording with microphones, either pull the microphone plugs from the MIC jacks or set the MIC switches to OFF.
- When using a microphone to record, it's a good idea to monitor the recording through your headphones.
- Monitoring the recording with the speakers very often gives rise to howl so use the microphone as far away from the speakers as possible.

MIXING RECORDING

You can mix the signals from the MIC input jacks, or those from the rear panel IN/OUT (Recording/Playback) connectors (DIN standard), with those of the line input (LINE INPUT) terminals.

1. Connect the microphone plug (or plugs) to the MIC jack (or jacks), and then connect the signals from the stereo amplifier to the LINE INPUT terminals. Remove the microphone plugs if you use a DIN connector. The microphone's signals will be mixed with the line signals with the microphone connected to its jack.
2. You can adjust the microphone signals or those available at the DIN connector with the MIC recording level controls. The signals from the stereo amplifier can be adjusted using the LINE recording level controls.
3. Refer to the section "Recording" on page 13 or the recording procedure.

NOTES:

1. *Set the recording level controls not used for mixing at their lowest level (turn right round to the left).*
2. *You will obtain much better results with mixing if you turn the LINE recording level controls down slightly rather than if you use the microphones or line input independently.*

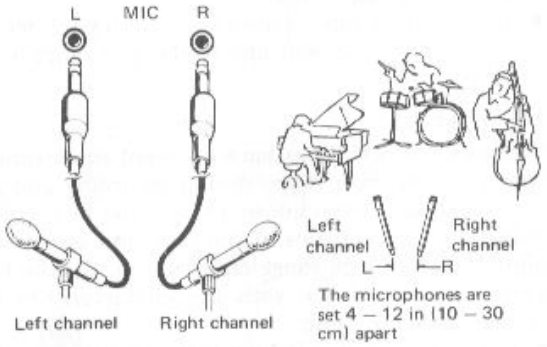


Fig. 19

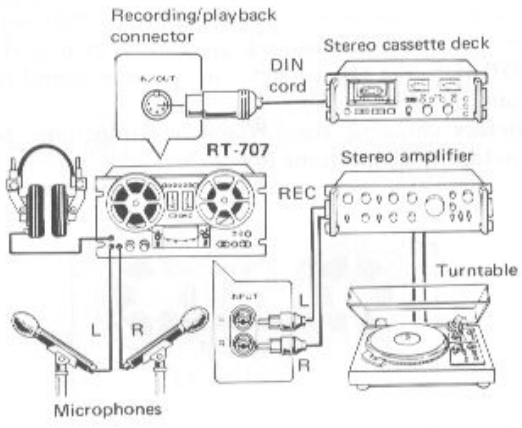


Fig. 20

OTHER METHODS OF RECORDING

SOUND-ON-SOUND RECORDING

Sound-on-sound is one method of recording you can pursue. It briefly involves mixing a fresh program source with the sound being played back on a monaural recorded tape. The new sound source is mixed and recorded on a different track. Let's take an example: you can all by yourself sing a duet or trio accompanied by background music which is played back as you sing.

L channel playback, R channel recording

1. Connect the R LINE INPUT terminal with the L LINE OUTPUT terminal on the rear panel of the RT-707. (Refer to Fig. 21).
2. Connect the microphone to the R MIC jack on the front panel.
3. Depress the R REC MODE switch (ON position) and release the L switch (OFF position).
4. Depress the TAPE MONITOR switch (TAPE position).
5. Check that the forward DIRECTION lamp has lit up and depress both the PLAY and REC buttons.
6. Using the LINE and MIC recording level controls, adjust the levels of the playback sound and microphone sound. Should the playback level be high, adjust with the L output level control on the rear panel.
7. Rewind the tape to start position then start the microphone recording, all the while listening to the L channel playback sound through the headphones. Table 2 shows the differences in the meter pointer deflections during recording and in the LINE OUTPUT terminal signals based on the positions of the MONITOR switch.

NOTE:
If you are planning R channel playback and L channel recording, carry out the above steps substituting L for R and R for L.
For example, if you record a duet on the R channel by the sound-on-sound method, and then go further to record the R channel playback sound and the fresh program source on the L channel, you will end up with a song in trio. You can keep on repeating the program source in this way for as many superimposed recordings as you like.

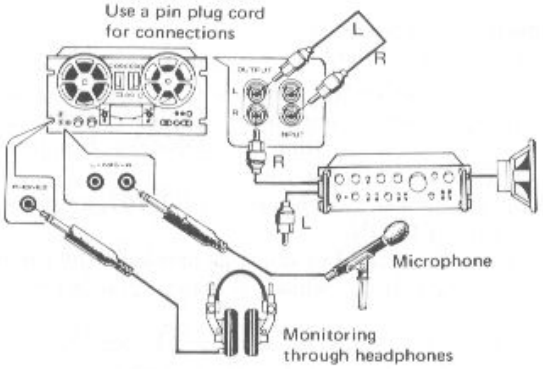


Fig. 21

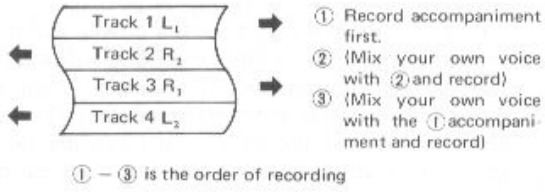

Track 1 L1
Track 2 R2
Track 3 R1
Track 4 L2
① Record accompaniment first.
② (Mix your own voice with ② and record)
③ (Mix your own voice with the ① accompaniment and record)
① – ③ is the order of recording

Fig. 22

Meter pointer deflections and output signals Table. 2

MONITOR switch	Channel	Level meter	OUTPUT terminal
TAPE PLAY	LEFT	Deflects	Already recorded signals
	RIGHT	Deflects	Signals just recorded
SOURCE	LEFT		
	RIGHT	Deflects	Signals for recording

RECORDING WITH TIMER SWITCH

The Timer switch which is sold separately, allows you to record while you are out or sleeping, or it can wake you up by playing back a recorded program source. It also has a 'sleeping' function.

Unattended Recording

1. As shown in Fig. 23 , connect the RT-707's power cable to the Time switch. Also, plug the power cables of the stereo amplifier and tuner into the timer so that their ON-OFF functions are controlled by the timer.
2. Set the power switches of the RT-707, amplifier and tuner to ON.
3. Adjust the amplifier controls and tune the tuner into the station whose program you want to record.
4. Follow the steps in section "Recording" on page 13 and proceed with recording. Set the recording levels.
5. Set the Timer switch so that the power will go on at the pre-determined time. The power to the other components goes OFF.
6. Press both the PLAY and REC buttons and check that the tape deck will be set to the recording mode when the power goes on.
   At the pre-determined time the power will automatically go on and the tape deck will start to record. The Timer switch will also turn the power off again at a pre-arranged time. You can therefore record programs while you are out — just follow the above steps and put your mind at ease.

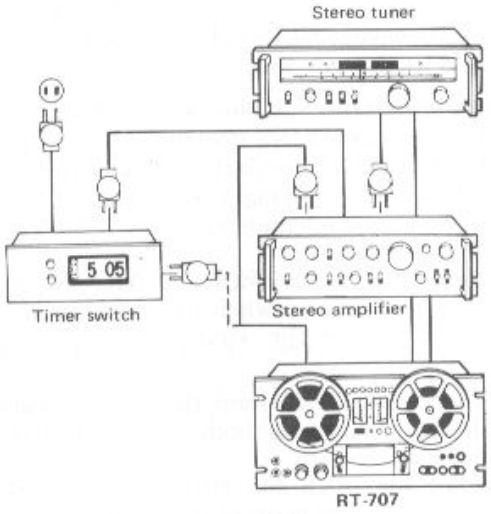


Fig. 23

Sleeping Function and Wake-up Playback

1. Connect the power cables of the RT-707 and the stereo amplifier to the Timer switch.
2. Set the timer so that the power goes off in 30 — 60 minutes. You can now relax and listen to music while you fall off to sleep (sleeping function).
3. If you set the timer so that the power goes on at a pre-determined time, carry out the instructions listed in steps 1 — 6 under the section "Playback" on page 10 and set the RT-707's POWER switch to ON, then playback will start at that pre-determined time (wake-up playback).

FOLLOW-UP RECORDING

You can record a new program source as you play back a previously recorded program source.

1. Connect the signals from the new program source to the LINE INPUT terminals or MIC jacks.
2. Adjust the recording level.
3. Press the PLAY button and the tape starts to play back. When the section of tape you want to re-record is heard, press the PLAY and REC buttons together.
4. The tape deck now starts to record the new program source.

NOTE:
The tape deck will not be set to the recording mode if you press just the REC button. You must press the PLAY button too.

LENGTHY MONO RECORDINGS

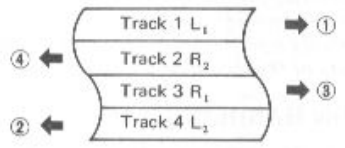
When the program source does not require recording in stereo, you can still make efficient use of all the tape tracks by recording in mono.

Operation

First, connect the program source to the L (or R) MIC jack, or to the L (or R) TAPE REC terminal. Then:

1. Depress the L (or R) REC MODE switch (ON position) and release the R (or L) switch (OFF position).
2. The sound is recorded on track 1.
3. Stop the tape before it is wound onto the right-hand reel.
4. Change over the reels — the recorded reel should now be on the left and the empty reel on the right. Do not rewind with the tape in the state outlined under (3).
5. When recording starts up again, the sound is recorded onto track 4.
6. Next, re-connect the recording signals to the R (or L) channel and switch the REC MODE switch over. Record exactly as before.

- For playback, refer to Section "Auto Repeat" on page 12. Remember that different signals enter into the L and R channels and so turn down the unnecessary sound with the volume control on the amplifier which you are using for playback, and fade it out.



① Recording signals: L channel
② (Turn tape over to second face) Recording signals: L channel
③ (Turn tape over to first face) Recording signals: R channel
④ (Turn tape over to second face) Recording signals: R channel
① – ④ indicates the order in which the tracks are recorded.

Fig. 24

RACK-MOUNTING

The RT-707 is designed to be mounted in racks that comply with EIA standard. Choose a rack which meets these standards.

MOUNTING PROCEDURE

1. Remove the RT-707's four legs.
2. Decide where you want to mount the tape deck and align the holes in the rack with those in the front panel.
3. Use the accessory screws to screw the front panel into the rack (see Fig. 25).

MOUNTING PRECAUTIONS

- Make sure that the rack is standing on stable ground.
- Keep the rack steady when mounting a component. Make sure that the heavy components are mounted in the bottom part of the rack.
- The inside temperature of a hermetically sealed rack tends to rise and so use a fan for ventilation.

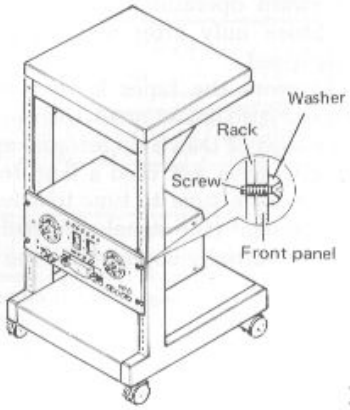


Fig. 25

HANDLING TAPES

If your tape has broken, you can mend it with the accessory splicing tape by carrying out the following steps.

1. As shown in Fig. 26, overlap the two ends of the broken tape and cut across them at an angle of about 60 degrees.
2. Prepare a 25mm long piece of splicing tape.
3. Put the reverse sides (the sides that do not come into contact with the heads) on a flat surface and align the two ends of the tape.
4. Hold the splicing tape ends tightly and attach the splicing tape.
5. Smooth the tape to remove any air bubbles.
6. Cut off any splicing tape which protrudes beyond the width of the tape.

NOTES:

- *Use a cutting instrument which is not magnetic.*
- *Splice the broken ends together along the break if you are splicing a pre-recorded tape and you do not want to lose any of the recording by overlapping the ends.*

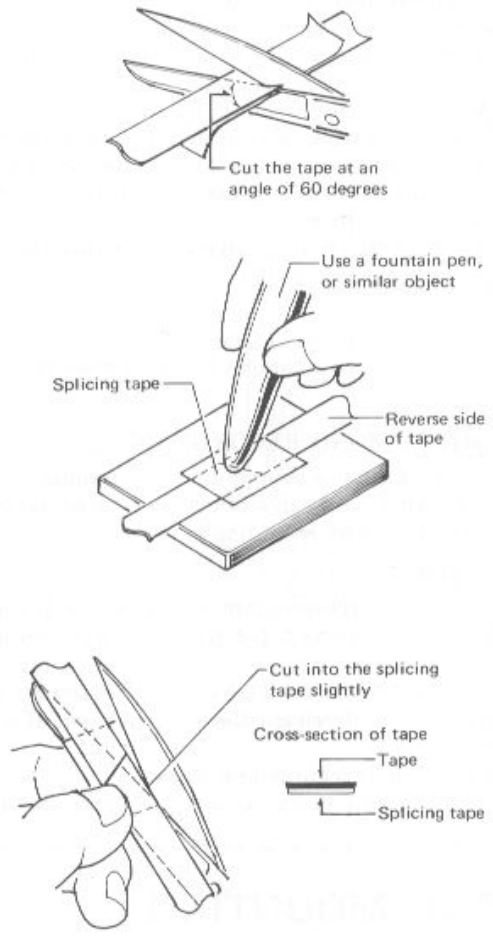

Cut the tape at an angle of 60 degrees
Use a fountain pen, or similar object
Splicing tape
Reverse side of tape
Cut into the splicing tape slightly
Cross-section of tape
Tape
Splicing tape

Fig. 26

HINTS ON HANDLING TAPES

- Do not use tapes which are creased, curled or have stretched edges. Also avoid using old tapes. Not only is their noise level high, but they may also damage the heads.
- Rewind new tapes and tapes that have not been used for some time before you record on them. Long-term storage accentuates the shape of the tape windings, and downgrades tape-to-head contact, thereby making it impossible to record high-fidelity sound.
- Never touch the upper (magnetized) side of the tapes since this is the cause of drop-outs in recorded sound.

TAPE STORAGE

- Tapes should not be stored after rewinding or fast forward operations which may deform the tape. Store only after winding at the regular playing speed.
- Do not store the tapes in very hot or humid locations. Also avoid areas with magnetic fields like the tops of television sets and amplifiers.
- When you have not used a tape for some time, rewind it from time to time to safeguard against 'print-through' (the signal recorded on one layer of tape is partially copied onto the two adjacent layers).

CARE AND MAINTENANCE

The RT-707 is made up of precision mechanisms. Bear in mind the points below so that you maintain your model in tip-top condition.

CLEANING THE HEADS AND TAPE PATH

Dust, grease and other foreign matter picked up during tape play have a habit of sticking to the heads, tape guides, shut-off lever, pinch roller, capstan and tension roller (refer to Fig. 27). In particular, dirt on the heads downgrades tape-to-head contact, sound quality and stereo balance. It is also the cause of unstable operation. To eliminate these problems, make it a habit to clean the heads and the surrounding tape path regularly with an accessory cleaning swab or with the accessory cleaning fluid applied to a soft cloth (see Fig. 27).

- You will find that it is easier to clean the pinch roller if you first remove the reels and press the PLAY button for several seconds since this operation causes the capstan and the pinch roller to rotate.

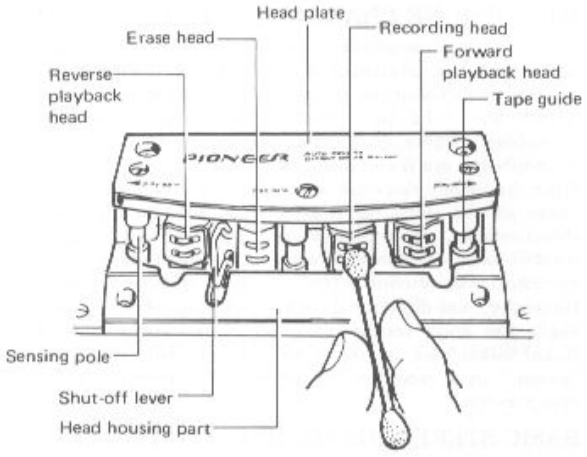


Fig. 27

CLEANING THE PANELS

Wipe the panels and casing when dusty or dirty with a polishing cloth or a dry cloth. If very dirty, dilute ordinary washing-up liquid to 5—6 times its normal strength, dip a soft cloth into the liquid and apply lightly. Then wipe with a dry cloth. Do not use furniture wax or cleaner. Do not use volatile chemical spirits like thinners, benzine and alcohol because they will damage the heads and the housing.

DEMAGNETIZING THE HEADS

The recording head becomes magnetized when you use the tape deck over prolonged periods of time. This results in noise being generated and the treble dropping off during recording or playback. The recording head should therefore be regularly demagnetized with the head eraser which is sold separately. For further details, read through the head eraser's 'instructions for use'.

NOTE:
Do not hold screwdrivers, metal objects or magnets close to the tape head.

REC AZIM and PLAY AZIM adjusting screws

Both PLAY AZIM (playback azimuth) screws and the REC AZIM (recording azimuth) screw are adjusted before the tape deck is shipped from the factory.
Do not adjust these screws unnecessarily since this may impair the quality of the sound.

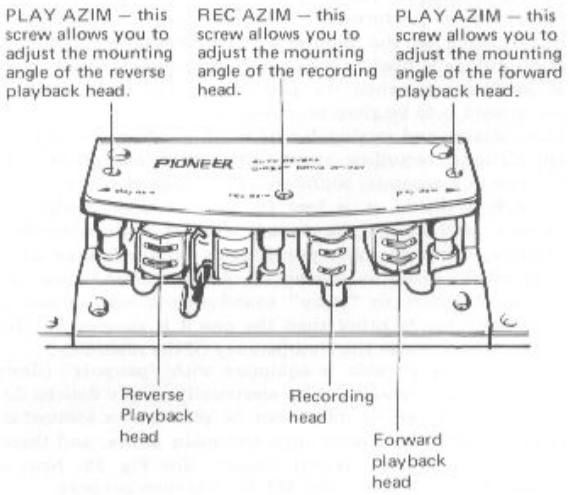

PLAY AZIM — this screw allows you to adjust the mounting angle of the reverse playback head.
REC AZIM — this screw allows you to adjust the mounting angle of the recording head.
PLAY AZIM — this screw allows you to adjust the mounting angle of the forward playback head.
Reverse Playback head
Recording head
Forward playback head

Fig. 28

LIVE RECORDING TECHNIQUES

The sound of live recordings is greatly influenced by the characteristics of the microphones used, by microphone placement, room acoustics and other factors. Effective mike recording also requires the use of mike stands, booms, mixers, wind screens, proper cables and other accessories.

MICROPHONE CHARACTERISTICS

These include sensitivity, frequency response, impedance and directional characteristics. For use with this Pioneer deck, microphones that exhibit the following characteristics are recommended. Sensitivity: −72 to −58dB/μ bar. Impedance: 600-ohms to 50-kohms. Where long mike cables must be used, 600-ohms microphones are preferable.

Wide frequency response is of course preferable, but the response curve should show no conspicuous peaks or dips. According to directionality, microphones can be classified roughly as "uni-directional" or "omni-directional". Some types have selector switches that provide either of these directional characteristics. Generally, uni-directional mikes with a relatively wide pick-up angle give good results in simple stereo recordings. Omni-directional mikes pick up room noise more easily, but they can lend "luster" to a recording by adding the indirect, reflected sound components.

BASIC STEREO RECORDING TECHNIQUES

The basic microphone placements for stereo recordings with uni-directional mikes are shown in Figs. 29, 30 and 31. The placement of Fig. 29 is called "one-point miking"; the distance between microphones and sound source must be increased as the source area increases in width. If this is observed, "one-point miking" can give quite good results.

The arrangement of Fig. 30 gives excellent source localization, but microphones of very sharp directionality should not be used as they could cause a loss of stereo definition. In Fig. 31-A, the distance between the microphones must not be too large to avoid the "hole-in-the-middle" effect. If the mikes must be placed more than 10 feet apart, a third center mike should be used as shown in Fig. 31-B.

MULTI-MIKING

In this technique, one microphone is assigned to each instrument (or group of instruments), and the signals are balanced with a mixer (such as the Pioneer Mixing Amplifier, model MA-62). Multi-miking is used in cases where instruments differ considerably in loudness, or when the particular timbre or "sheen" of each instrument is to be given prominence.

Multi-miking and mixing can be quite complicated; in professional applications, recording engineers monitor and control the signal balance in a separate, sound insulated control room. If no control room is available, it is best to monitor with headphones. First monitor and adjust the sound level of each microphone individually, changing mike positions as required, then adjust again with all instruments playing to obtain final balance. Also, pay special attention to "stray" sound that a microphone picks up from instruments other than the one it is assigned to. Too much "stray" deteriorates the transparency of the recording.

If the mixing console is equipped with "panpots" (devices that "focus" a microphone set-up electrically in any desired direction), an additional pair of mikes can be placed at a somewhat greater distance from the source than the main mikes, and these can be to fill in for better overall balance. See Fig. 32. Note that the Pioneer Mixing Amp, Model MA-62, has such panpots.

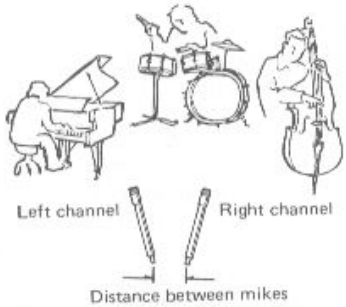


Fig. 29

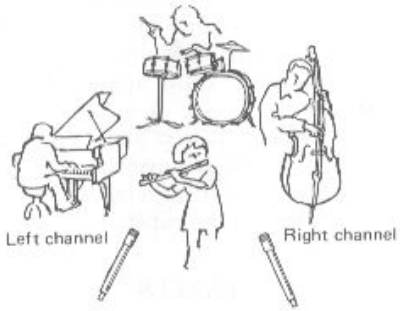


Fig. 30

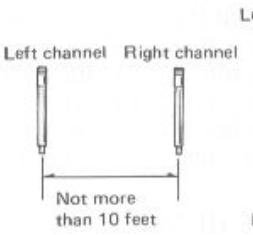


Fig. 31-A

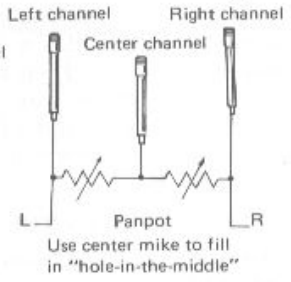


Fig. 31-B

MIC: Auxiliary stereo mike
: Level control for each mike

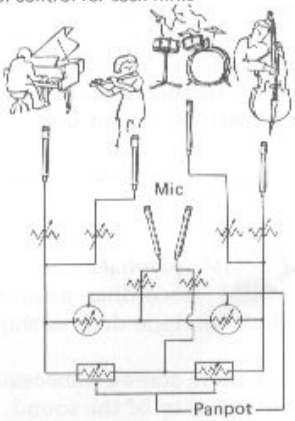


Fig. 32

SPECIFICATIONS

Type	4-track, 2-channel stereo tape deck (Recording, playback with reverse playback)
Operation system	Solenoid drive, Pushbutton direct change system, Timer can be set for recording and playback.
Heads	Recording Head ; 1 Erase Heads ; 1 Forward playback Head ; 1 Reverse playback Head ; 1
Motors	Capstan drive motor ; 1 (FG-system, AC servo, direct drive) Reel base drive motors ; 2 (6-pole inner rotor induction type)
Acceptable Reel Size	7in (17cm)
Tape Speed	19cm/s (7-1/2ips), 9.5cm/s (3-3/4ips) ±0.5%
Fast Forward/Rewind Times	Less than 100 sec. with 7-inch reel and 370m tape
Wow and Flutter	Less than 0.05% WRMS (19cm/s) Less than 0.08% WRMS (9.5cm/s)
Signal-to-Noise Ratio	More than 58dB
Total Harmonic Distortion	Less than 1% (19cm/s)
Frequency Response	
19cm/s	20Hz to 28,000Hz (30Hz to 24,000Hz ±3dB)
9.5cm/s	20Hz to 20,000Hz (30Hz to 16,000Hz ±3dB)
Crosstalk	More than 50dB
Channel Separation	More than 50dB
Erasure Rate	More than 70dB
Recording Bias Frequency	125kHz
Equalization	NAB Standards

Inputs (Sensitivity/Maximum allowable level/Input impedance)
MIC; 0.25mV/125mV/27kΩ, 6mm diam. jacks (suitable microphone, 250Ω to 30kΩ)
LINE; 50mV/25V/100kΩ,
DIN; 16mV/8V/1.3kΩ, DIN standards

Outputs (Reference level/Maximum level/Load impedance)
LINE; 450mV/700mV/50kΩ,
DIN; 450mV/700mV/50kΩ, DIN standards
HEADPHONES; 70mV/8Ω, 6mm diam. jack

Semiconductors	67 transistors (4 FET's), 5 IC's, 47 diodes (1 thyristor, 2 LED's, 4 Zener diodes, 2 varistors,)

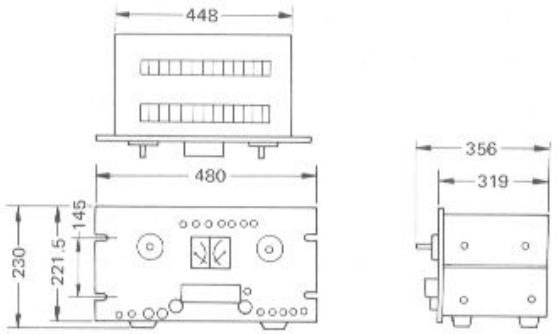
Accessory Functions
- Pitch control (±6% of rated tape speed)
- Auto reverse playback (with sensing tape: manual reverse is possible)
- Auto repeat (counter-interlocked)
- Recording mode switches (L, R independent)
- Tape selectors: BIAS (STD/LH); EQ (STD/LH)
- MIC/LINE mixing
- Output volume controls
- Pause indicator lamp

Power Requirements	AC 120V 60Hz
Power Consumption	120 watts, Max.
AC Outlets	Unswitched (300W max.) x 1
Dimensions	480(W) x 230(H) x 356(D)mm 18-29/32 x 9-1/16 x 14in
Weight	Without package; 20.0kg 44lb 1oz With package; 23.5kg 51lb 13oz

Accessories
- 7in metal reel (Pioneer PR-85) x 1
- Connecting cord with pin plugs x 2
- Head cleaning kit x 1
- Sensing tape x 1
- Splicing tape x 1
- Operating instructions x 1

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.

Dimensions



unit = mm

Test Conditions:

1. Reference recording level: meter 0dB level (NAB standard reference level)
2. Reference signal: 1,000Hz
3. Wow & Flutter: at 3,000Hz weighted RMS
4. Frequency response: measured at −20dB level (19cm/s)
5. Signal-to-Noise ratio: measured at +6dB level
6. Total Harmonic Distortion: measured at reference recording level
7. Channel separation: measured at reference recording level
8. Channel crosstalk: measured at 0dB level (reference recording level)
9. Sensitivity: Input level (mV) for reference recording measured with input (recording) level control set at maximum position.
10. Maximum allowable input level: measured at the point where the output signal wave is clipped while gradually turning the input control.
11. Reference output level: meter 0dB level.
12. Maximum output (playback) level: Output level to reference recording level, measured with output (playback) level control set at maximum position.

TROUBLESHOOTING

Failures and breakdowns can be traced to mechanical defects or they may appear to be caused by such, but are in fact the result of improper maintenance, tape defects or lack of experience in operating the tape deck, since the symptoms are quite often the same. Before contacting the serviceman, check the following points.

Symptom	Cause	Remedy
1. Power does not go on.	Power cable is not connected properly.	Check power cable connection.
2. Tape does not run properly.	a. Tape is slack. b. The size of the left and right reels is not identical.	a. Pull tape taut. b. Use reels of the same size.
3. Deck fails to rewind.	Size of reels differs greatly.	Use reels of the same size.
4. Noise is generated (great deal).	a. Connecting cables are not connected properly. b. Noise is on tape. c. External induction. d. Head is magnetized.	a. Check the connections. b. Replace with a good-quality tape and compare results. c. Do not use deck near TV, amplifier, fluorescent lights, etc., since these cause induced noise. d. Demagnetize head with head eraser.
5. Sound drop-out .	a. Heads are dirty. b. Tape is dirty. c. Tape is deformed.	a. Clean front of heads with accessory cleaning fluid. b. } Replace tape with good-quality tape. c. }
6. Playback sound is unnatural. (Poor sound quality, distortion, extraneous noise etc.)	a. Heads are dirty. b. Incorrect tape speed. c. Tapes have different track configuration.	a. Clean front of heads with accessory cleaning fluid. b. Adjust to correct tape speed. c. Replace tapes.
7. Deck fails to record (level meter pointers do not deflect, either).	Connecting cables are not connected properly.	Check INPUT (REC) terminals.
8. Distortion in recording.	a. Input level is too high. b. Recording level is too high. c. BIAS, EQ switches are incorrectly set.	a. When tuner or amplifier output level is too low, adjust while maintaining recording level controls at central position. b. Re-adjust recording level. c. Set switches properly in accordance with characteristics of tape.
9. Sound in high frequencies is unsatisfactory.	a. Heads are dirty. b. BIAS, EQ switches are incorrectly set.	a. Clean front of heads with accessory cleaning fluid. b. Set switches properly in accordance with characteristics of tape.

Moisture forms in the operating sections of this model and the model's performance will be impaired if the model is brought from cool surroundings into a warm room or if the temperature of the room rises suddenly.

To prevent any performance impairment, let the model stand in its new surroundings for about an hour before switching it on, or ensure that the room temperature rises gradually.

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